# EXHIBIT 4

**UNITED STATES DISTRICT COURT**
**SOUTHERN DISTRICT OF NEW YORK**

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| CITY OF WESTLAND POLICE AND FIRE RETIREMENT SYSTEM, Individually and On Behalf of All Others Similarly Situated,<br><br>Plaintiff,<br><br>vs.<br><br>METLIFE, INC., et al.,<br><br>Defendants. | ) | No. 12 Civ. 0256 (LAK) (OTW) |

# AMENDED SECOND REBUTTAL REPORT OF PROFESSOR ALLEN FERRELL

**December 18, 2018**

## I. Introduction and Summary of Conclusions

1. I submitted a report in the above-captioned litigation on October 19, 2017 ("Ferrell Report").[1] In that report, I provided my qualifications and set forth and provided the bases for my principal conclusion that "the economic evidence does not support Plaintiff's claim that the Alleged Misstatements caused MetLife's stock price to decline during the Relevant Period [August 3, 2010 through May 14, 2012]; rather, the Company's stock price decline is attributable to other factors, including adverse changes in market and industry conditions that occurred after the Offerings."[2] I defined the Relevant Period of my analysis based on the date the August 2010 Prospectus was filed (August 3, 2010) and on my understanding that the first complaint in this case that alleged claims under §11 of the Securities Act was filed on May 14, 2012.[3] I also submitted a rebuttal report on November 30, 2017 ("Ferrell Rebuttal Report") in which I principally reported the results of revising the Relevant Period to end on January 12, 2012 based on the date of an earlier complaint upon which Plaintiff's expert Steven P. Feinstein relied in his description of how to estimate alleged §11 damages.[4] Finally, I submitted another rebuttal report on November 16, 2018 ("Ferrell Second Rebuttal Report") in response to a report by Professor Feinstein dated October 12, 2018 ("Feinstein Damages Report") in which I principally opined that "Professor Feinstein's analysis of loss causation during the Putative Class Period corroborates my conclusion in the

1. The Ferrell Report provides information on my qualifications and defines capitalized terms.
2. Ferrell Report ¶ 16.
3. *Id.* ¶ 14.
4. Ferrell Rebuttal Report ¶¶ 4-5. The Ferrell Rebuttal Report defines additional capitalized terms.

Ferrell Report that the economic evidence does not support Plaintiff's claim that the Alleged Misstatements caused MetLife's stock price to decline during that period" and that "Professor Feinstein's analysis of materiality, loss causation, and damages regarding the alleged corrective disclosure on October 6, 2011 is fundamentally flawed and unreliable."[5]

2. I understand that because Plaintiff has changed the Putative Class Period from the period December 6, 2010 through October 6, 2011 to the period beginning after 4:04 PM EST on February 9, 2011 through October 6, 2011 ("Amended Putative Class Period"), Plaintiff submitted an amended version of the Feinstein Damages Report that is dated December 13, 2018 ("Feinstein Amended Damages Report") in which Professor Feinstein again purports to analyze Plaintiff's claims under Section 10(b) of the Exchange Act of 1934 (the "Exchange Act") and SEC Rule 10b-5 adopted thereunder.[6, 7] In the Feinstein Amended Damages Report, Professor Feinstein opines, among other things, that: 1) MetLife's stock traded in an efficient market over the Amended Putative Class Period; 2) "[o]ver the course of the Class Period, the alleged misrepresentations and omissions caused the price of MetLife's stock to be artificially inflated"; and 3) "[d]ue to Defendants' misrepresentations and

5. Ferrell Second Rebuttal Report ¶ 5. The Ferrell Second Rebuttal Report defines additional capitalized terms.

6. Feinstein Amended Damages Report ¶ 5. Plaintiff previously submitted a report by Professor Feinstein dated November 30, 2017 ("Feinstein Rebuttal Report") that purported to "consider, evaluate, and respond to" my opinion in the Ferrell Report. Feinstein Rebuttal Report ¶ 3. I reviewed the Feinstein Rebuttal Report and conclude that nothing in it affects my opinion in any way.

7. I understand that the operative complaint in this case is the [Proposed] Fourth Amended Class Action Complaint for Violations of the Federal Securities Laws ("Complaint").

omissions, MetLife's stock price was inflated by $0.69 per share at the start of the Class Period."[8]

3. In support of his opinions, Professor Feinstein conducted an event study analysis which, among other things, he claims "proves empirically that when the allegedly omitted information was disclosed, the price of MetLife stock declined significantly [on October 7, 2011], proving the materiality of the alleged misrepresentations and omissions."[9] He further claims that his event study analysis of the price reaction to the October 6, 2011 Disclosure "proves that the alleged misrepresentations and omissions caused the price of MetLife stock to be artificially inflated, and that the corrective disclosure caused a stock price decline and investor losses."[10]

4. I have been asked by counsel for MetLife to analyze the economic evidence as it relates to Professor Feinstein's analysis of loss causation and damages in the Amended Feinstein Damages Report. Appendix A is the current version of my curriculum vitae, which summarizes my testimony in the last four years and academic work. Appendix B identifies the materials that I relied upon in connection with the preparation of this report.

5. Based on these materials and my analysis, I have reached the following principal conclusions:

8. Feinstein Amended Damages Report ¶¶ 5, 23, 24 & 27.
9. *Id.* ¶¶ 25 & 230.
10. *Id.* ¶ 26.

- Professor Feinstein's analysis of loss causation during the Amended Putative Class Period corroborates my conclusion in the Ferrell Report that the economic evidence does not support Plaintiff's claim that the Alleged Misstatements caused MetLife's stock price to decline during that period.

- Professor Feinstein's analysis of materiality, loss causation, and damages regarding the alleged corrective disclosure on October 6, 2011 is fundamentally flawed and unreliable.[11]

I elaborate upon and provide the bases for these conclusions in the remainder of this report.

## II. Professor Feinstein's Analysis of Loss Causation During the Amended Putative Class Period Corroborates My Conclusion in the Ferrell Report that the Economic Evidence Does Not Support Plaintiff's Claim that the Alleged Misstatements Caused MetLife's Stock Price to Decline During that Period

6. I stand by my prior opinion that the economic evidence does not support Plaintiff's claim that the Alleged Misstatements caused MetLife's stock price to decline during the Relevant Period. My prior analysis related to Plaintiff's §11 claims and, accordingly, I analyzed the longer period of time relevant to those claims. Because I defined the Relevant Period as August 3, 2010 through May 14, 2012, it includes the Amended Putative Class Period related to Plaintiff's §10(b) claims and so my conclusion applies to this period as well.[12]

7. During the Amended Putative Class Period, MetLife's closing stock prices fell from a high of $48.23 on February 11, 2011 to a low of $26.60 on October 3,

11. To be clear, I offer no opinion on materiality. I simply note that Professor Feinstein's opinions with respect to materiality that depend on his fundamentally flawed event study are unreliable.

12. Ferrell Report ¶ 14. I defined the Alternative Relevant Period analyzed in the Ferrell Rebuttal Report as ending on January 12, 2012, hence it also includes the Amended Putative Class Period. Ferrell Rebuttal Report ¶ 5.

2011, a decline of $21.63 or 44.8 percent.[13] Professor Feinstein attempts to establish loss causation during the Amended Putative Class Period but concludes that *none* of the decline in MetLife's stock price during this period can be used to measure alleged damages.

8. Indeed, when confronted with the fact that his own event study found that the residual return on August 5, 2011 was not statistically significant, Professor Feinstein did not ascribe any loss to the alleged corrective disclosure on this date.[14] Put differently, he did not attribute loss causation to any alleged corrective disclosure unless his event study found that the concomitant residual return was statistically significant.

9. Although Professor Feinstein states that he is being conservative by excluding this non-statistically significant decline from his measure of alleged damages,[15] in reality, he did not include the decline because he cannot: the economic evidence does not support loss causation where there is no statistically significant residual decline. In the exact same way, I found no reliable economic basis to associate information related to Plaintiff's allegations with a statistically significant negative residual return in MetLife's stock during the Relevant Period. Consequently, Professor Feinstein's analysis of loss causation and damages during the Amended Putative Class Period corroborates my conclusion in the Ferrell Report that the

13. Feinstein Amended Damages Report Exhibit-8.
14. Feinstein Amended Damages Report ¶ 210.
15. *Id.*

economic evidence does not support Plaintiff's claim that the Alleged Misstatements caused MetLife's stock price to decline during that period.[16]

## III. Professor Feinstein's Analysis of Materiality, Loss Causation, and Damages Regarding the Alleged Corrective Disclosure on October 6, 2011 Is Fundamentally Flawed and Unreliable

### A. Professor Feinstein's Event Study Fails to Establish that the Residual Return on October 7, 2011 Is Statistically Significant

10. Professor Feinstein states that based on his event study, MetLife's residual return on October 7, 2011 is "deemed statistically significant," which he claims "prov[es] the materiality of the alleged misrepresentations and omissions" and "proves that the alleged misrepresentations and omissions caused the price of MetLife stock to be artificially inflated, and that a corrective disclosure caused a stock price decline and investor losses."[17] However, as explained below, his event study is fundamentally flawed and unreliable and therefore fails to establish that the residual return on October 7, 2011 is statistically significant. Consequently, Professor Feinstein's event study – which provides the principal basis for his conclusions – fails to support his opinions regarding materiality, loss causation, and damages in this matter.

11. As explained in more detail in Ferrell Report Appendix C, "the variability of MetLife's residual returns substantially increased after Standard & Poor's ('S&P') downgraded the U.S. credit rating on August 5, 2011, which Plaintiff acknowledges

16. The high closing price during the Amended Putative Class Period of $48.23 is above the offering prices for the August 2010 Offering and the March 2011 Offering of $42.00 and $43.25, respectively. Ferrell Report ¶¶ 6 & 7. The low closing price of $26.60 is below the closing price on October 7, 2011 of $28.80. Feinstein Amended Damages Report Exhibit-8.

17. Feinstein Amended Damages Report ¶¶ 25, 26, 165 & 166.

'was the first time in history that U.S. credit/debt rating had been downgraded.'"[18] Consequently, when analyzing MetLife stock price returns during the Amended Putative Class Period, one must carefully assess the effect of this changing variability in constructing an event study. Professor Feinstein failed to do so and, as a result, his analysis and conclusions regarding the stock price reaction on October 7, 2011 to the October 6, 2011 alleged corrective disclosure are fundamentally flawed and unreliable.[19]

12. The reason for Professor Feinstein's erroneous finding of statistical significance on October 7, 2011 is his failure to account for the significant change in the variability of residual returns in MetLife's stock over time, or "heteroscedasticity." For stock returns, heteroscedasticity occurs when the variation in the residual returns changes in magnitude over the course of the time period at issue. The increased variability leading up to October 7, 2011 results in an increased likelihood of mistaking the significance of individual residual returns.[20]

13. The assumption that the size of residual returns does *not* vary substantially over time – in other words, the *absence* of heteroscedasticity – is a fundamental assumption underlying inferences from a standard linear regression model, upon which Professor Feinstein's event study is based. This premise is explained by any

18. Ferrell Report ¶ 25.
19. Because the October 6, 2011 disclosure occurred after the market closed, the first date the market reacted to this disclosure was on October 7, 2011. *See*, e.g., Feinstein Amended Damages Report ¶ 145.
20. Ferrell Report ¶ 25 & Appendix C.

number of standard sources in the academic literature and is not disputed by Professor Feinstein.[21]

14. Nevertheless, Professor Feinstein's event study incorrectly assumes the absence of heteroscedasticity. Accordingly, his event study produces errors regarding statistical significance, in particular an increased likelihood of finding residual returns to be statistically significant. In other words, a residual return may appear statistically significant when it is not.

15. Professor Feinstein's failure to take into account the presence of heteroscedasticity leads to this type of false positive. Specifically, Professor Feinstein's conclusion that the residual return on October 7, 2011 is statistically significant is unreliable and erroneous. Because Professor Feinstein ignored the change in volatility following the S&P downgrade, he focused his event study on an estimation period in which most residual returns were relatively small, but used his event study to assess the significance of a date – October 7, 2011 – that occurred in a period during which residual returns were relatively large. Professor Feinstein erroneously concluded that the residual return on October 7, 2011 is statistically significant – and therefore the result of company-specific factors – rather than simply due to a period of higher volatility.

16. Modifying Professor Feinstein's model to account for heteroscedasticity demonstrates that there is, in fact, no statistically significant residual decline in MetLife's stock price on October 7, 2011.

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21. Professor Feinstein recognizes that the absence of heteroscedasticity is an "underlying condition for an OLS regression," i.e., the regression method he applied. Feinstein Rebuttal Report ¶ 75.

17. One way to assess whether heteroscedasticity is present is to visually inspect patterns of residual returns.[22] To illustrate, Exhibit 1 shows the residual returns from Professor Feinstein's event study over time, net of the dates he excluded from his analysis.[23] The pattern in the residuals is striking – prior to the S&P downgrade on August 5, 2011,[24] the residual returns primarily lie between -0.014 and 0.016,[25] while after the S&P downgrade the spread of the residuals increases markedly (ranging between -0.038 and 0.030). A typical *homo*scedastic model (i.e., where heteroscedasticity is not present) would show that the range of residual returns remains constant throughout the entire period, which is consistent with the pre-August 8, 2011 data reflected in Exhibit 1. Here, by contrast, although only two percent of the residual returns fall outside the range of -0.014 and 0.016 prior to August 8, 2011, after that date nearly *a quarter* of the residuals fall outside of that range.[26] This pattern provides evidence for the presence of heteroscedasticity.

18. Another commonly used graphical method to assess the presence of heteroscedasticity is an inspection of the relationship between the residual returns

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22. *See*, e.g., Gujarati, Damodar N., and Dawn C. Porter, *Basic Econometrics*, Boston: McGraw-Hill Irwin, 2009, pp. 377-378.

23. Professor Feinstein excluded from the estimation period (i.e., the Amended Putative Class Period) underlying his event study the effects of four events he analyzed for his tests of market efficiency "[u]sing dummy (indicator) variables to control for potentially unusual events in the estimation period, especially when those dates are the subject of the event study analysis …." Feinstein Amended Damages Report ¶ 156 & n.87.

24. The S&P downgrade was announced after the market closed on August 5, 2011, making August 8, 2011 the date the market first reacted to this announcement. Ferrell Report ¶ 40.

25. These are the values of the 1st and 99th percentiles of the values of the residuals prior to the S&P downgrade; in other words, 98 percent of the residuals in the period prior to the S&P downgrade lie within this range.

26. That is, 10 out of the 43 residual returns calculated from Professor Feinstein's event study after the S&P downgrade lie outside the 1-99 percentile range calculated from the pre-downgrade period residuals.

and the fitted values from the event study regression.[27] When heteroscedasticity is not present, one would expect to see no evident pattern in the plot. As shown in Exhibit 2, an inspection of the relationship between the residuals and the fitted values from Professor Feinstein's event study reveals that the spread of residuals exhibits a decrease followed by an increase as the fitted values increase in magnitude, which implies a nonlinear relationship between the fitted values and the residuals.[28] These graphical analyses provide further evidence for the presence of heteroscedasticity, rendering Professor Feinstein's evaluation of the statistical significance of residual returns unreliable.

19. In addition to this clear visual inspection, the predicted and erroneous increases in statistically significant dates are demonstrated in Professor Feinstein's own analysis. In a properly specified event study, approximately five percent of the dates are expected to be associated with a statistically significant stock price movement due to random chance. However, as shown in Exhibit 3, Professor Feinstein's event study finds that during the Amended Putative Class Period prior to the S&P downgrade, the percentage of residual returns that were statistically significant net of the dates he excluded from his event study[29] is only 1.7 percent, while in the remainder of the Amended Putative Class Period through October 6,

27. Gujarati et al. (2009), p. 377. Professor Feinstein refers to the fitted values as the "explained returns." Feinstein Amended Damages Report ¶ 149.
28. *See* Mooi, Erik, Marko Sarstedt and Irma Mooi-Reci, *Market Research: The Process, Data, and Methods Using Stata*, Springer Texts in Business and Economics, 2018, p. 229.
29. *See supra* ¶ 17 n.23.

2011, the percentage dramatically increases to 16.3 percent.[30, 31] In other words, his event study is substantially more likely to find a statistically significant residual return after the S&P downgrade. Since October 7, 2011 is the day after the end of the Amended Putative Class Period, it belongs to the group of dates that have a higher likelihood of being found statistically significant in Professor Feinstein's event study analysis. Thus, it is not surprising that he erroneously finds a statistically significant residual return on this date.

20. Although the presence of heteroscedasticity is evident on visual inspection and on review of Professor Feinstein's event study results, there are also formal tests through which its presence can be confirmed. There are several commonly accepted diagnostic tests that can be applied to assess the presence of heteroscedasticity,[32] including the White test and the Breusch-Pagan test.[33] The White test is considered a general test – unlike other common tests (like the Breusch-Pagan test), the White test requires no assumptions about the structural form of the residual variance. It is therefore suitable for detecting heteroscedasticity of the nonlinear form implied by Exhibit 2, making it the appropriate test in this instance.[34] For this reason, to

30. A standard statistical test of the difference between the two proportions shows that their difference is statistically significant at the 95 percent confidence level.

31. I note that none of the events that Professor Feinstein identified as appropriate for testing market efficiency occurred during the Amended Putative Class Period after August 5, 2011.

32. These tests are used to determine whether the null hypothesis of homoscedasticity can be rejected. In other words, they assess whether one can rule out homoscedasticity with a high degree of statistical confidence. However, the fact that one test does not reject the null hypothesis by itself does not imply the absence of heteroscedasticity. It simply means that homoscedasticity cannot be ruled out. Conversely, if a test does reject the null hypothesis of homoscedasticity with a high degree of statistical confidence, then heteroscedasticity is an issue.

33. *See*, e.g., Gujarati et al. (2009), pp. 385-387.

34. Because there appears to be a nonlinear relationship between fitted values and residual returns in Professor Feinstein's event study, some formal tests for heteroscedasticity (for example, the typical application of the Breusch-Pagan test) would fail to detect heteroscedasticity on its own

formally test for the presence of heteroscedasticity in Professor Feinstein's event study framework, I performed a White Test.

21. The White test applied to Professor Feinstein's event study analysis rejects the null hypothesis of homoscedasticity (with a p-value of 0.0097). A p-value above 0.05 indicates a lack of evidence that the explanatory variables help explain the heteroscedasticity of the residuals. A p-value of 0.0097 falls well below this threshold, strongly rejecting homoscedasticity and indicating the presence of heteroscedasticity with a high level of statistical confidence.

22. In other words, the White test further demonstrates the presence of heteroscedasticity during the Amended Putative Class Period. Thus, Professor Feinstein's statistical testing on the residual returns from his event study ignoring heteroscedasticity renders his statistical conclusions misleading and unreliable because his linear regression model relies on a core assumption that is demonstrably invalid in this case (namely, the absence of heteroscedasticity).[35]

23. As discussed in the Ferrell Report, a standard way to correct a regression model which suffers from heteroscedasticity is to perform a generalized least squares ("GLS") regression, which gives more weight to observations from periods believed to be more stable and less weight to observations from periods believed to be more volatile.[36] I corrected Professor Feinstein's event study model with respect to the

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because they test for heteroscedasticity that is *linear* in the fitted values. Mooi et al. (2018), p. 229, indicate that when the White test and a Breusch-Pagan test do not provide comparable results, one should rely on the White test due to its generality.

35. Gujarati et al. (2009), p. 375.

36. Ferrell Report Appendix C ¶ 10.

heteroscedasticity associated with the S&P downgrade described above by implementing GLS regression techniques.[37, 38]

24. Exhibit 4 presents the estimates from my corrections of Professor Feinstein's fundamentally flawed event study analysis. I find that after my corrections, the residual return on October 7, 2011 is *not* statistically significant, with a *t*-statistic of -1.69.[39] Therefore, I find that MetLife's stock price decline on October 7, 2011 cannot reliably be attributed to the firm-specific information contained in the October 6, 2011 Disclosure as Professor Feinstein claims.[40]

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37. Specifically, I estimate the weights for the GLS regression from a regression of the OLS squared residuals on a constant and an indicator variable for the post-S&P downgrade period.

38. Professor Feinstein also mistakenly calculated the *t*-statistic for the October 7, 2011 event date as a result of two separate errors. For completeness and accuracy, I explain those errors below and correct for them. However, after accounting for heteroscedasticity using GLS, October 7, 2011 is not statistically significant with or without the below corrections.

First, Professor Feinstein divided the residual return on that date by the regression Root Mean Squared Error instead of appropriately using the standard error of the forecast of this date. An appropriate method to calculate the correct *t*-statistic for the date of interest would be to include a dummy variable for October 7, 2011 in the regression and report the *t*-statistic of the coefficient on this dummy variable. My analysis correctly reports the relevant *t*-statistic for the October 7, 2011 residual return using this method. *See*, e.g., Salinger, Michael, "Standard Errors in Event Studies," 27 *Journal of Financial and Quantitative Analysis*, no. 1 (1992), 39-53.

Second, because the dependent variable in Professor Feinstein's event study is the natural logarithm of MetLife's stock return, the residual return for event date *t* with a coefficient estimate of $\beta$ and a variance for the coefficient of $V(\beta)$ is calculated using the commonly accepted transformation $[exp[\beta - 0.5V(\beta)] - 1]$. I calculate the standard error of the residual return using the delta-method. *See* Kennedy, Peter, "Estimation with Correctly Interpreted Dummy Variables in Semilogarithmic Equations," 71 *American Economic Review*, no. 4 (1981), 801.

39. A *t*-statistic is deemed statistically significant if its absolute value is above the critical value of 1.96. Feinstein Amended Damages Report ¶ 161 n.90.

40. Moreover, Professor Feinstein's results are not robust. For example, he originally constructed his flawed and unreliable event study to test the efficiency of the market for MetLife stock, creating "dummy (or indicator) variables to control for potentially abnormal returns on the tested event dates that occurred during the Class Period." Feinstein Amended Damages Report ¶ 156. He used the same model when he turned to his analysis of loss causation and damages without adjusting his choice of dummy variables, relying on the same market efficiency dummy variables to conduct a separate test of the Alleged Corrective Disclosures. *Id.* ¶¶ 156 & 206.

The flaw in this use of the original model for a separate purpose is evident from Professor Feinstein's own assertion that "[a]n event study testing market efficiency does not require a

25. Professor Feinstein has provided no basis for his damage calculations other than the October 7, 2011 stock price decline. Professor Feinstein includes this date in his inflation ribbon calculation because he deemed it to be statistically significant. However, as discussed above, October 7, 2011 is not statistically significant based on an event study using proper methodology. Accordingly, there are no price declines to consider for Plaintiff's inflation ribbon calculation, and therefore no basis for Professor Feinstein's damages calculations.[41]

### B. Professor Feinstein Otherwise Fails to Support His Opinion that Alleged Inflation in MetLife's Stock Price Throughout the Amended Putative Class Period Was $0.69

26. Setting aside the lack of any statistically significant price decline associated with the Alleged Misstatements, Professor Feinstein opines that the alleged inflation

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comprehensive identification of all events during the Class Period … on which new allegation-related information was disclosed," but a "comprehensive identification of all disclosures of information related to the alleged fraud … is properly addressed in an analysis of loss causation and damages." *Id.* ¶ 145 & Feinstein Damages Report ¶ 148 n.83.

Professor Feinstein's selection of dummy variables to test market efficiency is useful to demonstrate the lack of robustness of his model, even setting aside the question of heteroscedasticity that undermines his statistical conclusions. Using his selected dummy variables, Professor Feinstein finds October 7, 2011 statistically significant. Replicating Professor Feinstein's event study but substituting his market efficiency dummy variables with the more relevant eleven dummy variables related to Plaintiff's allegations used in my event study, I find that the *t*-statistic on October 7, 2011 is -1.75, below the threshold for statistical significance. If I re-run the model including only the seven dummy variables related to Plaintiff's allegations that are specifically discussed in the Complaint, I again find that the *t*-statistic on October 7, 2011 is below the threshold for statistical significance, at -1.78. Hence, the lack of statistical significance result occurs even without correcting for heteroscedasticity, revealing that Professor Feinstein's results are not robust.

41. Note that with regard to his analysis of the alleged corrective disclosure on August 5, 2011, Professor Feinstein states: "While the partially corrective disclosure reasonably negatively impacted the stock price that day, the magnitude of the effect was not large enough to register as a statistically significant effect. I therefore conservatively excluded the impact of the allegation-related information that day from my inflation ribbon calculation." Feinstein Amended Damages Report ¶ 210.

throughout the Amended Putative Class Period is $0.69 per share – approximately *six times* the value of the estimated one-time after-tax charge attributable to the SSA-DMF issue of $0.11 to $0.13 per share that was disclosed on October 6, 2011 and forms the basis of Plaintiff's allegations.[42] Professor Feinstein provides no reliable support for his opinion that the price impact of the disclosure of the estimated charge amount should be as much as six times larger than the amount of the estimated charge itself. He claims: "It is reasonable that the valuation impact of the changed practices going forward is much larger than the one-time charge. MetLife's use of the SSA-DMF going forward would likely require additional costs on a recurring per year basis."[43] However, Professor Feinstein's basis for his claim comes from two internal documents that were not made public on or around October 7, 2011 and thus had no influence on MetLife's stock price change that day.[44] Moreover, he provides no analysis to support his opinion that the valuation impact of the estimated charge plus the discounted present value of any additional future costs was $0.69 per share.

27. Professor Feinstein also fails to provide any evidence that market participants considered any additional costs to be "much larger than the one-time charge." In fact, analyst statements and discussions surrounding the October 6, 2011 disclosure

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42. MetLife disclosed that the charge related to SSA-DMF would be in the range of $115 to $135 million. MetLife, Inc. Form 8-K filed October 6, 2011. As of July 29, 2011, MetLife had 1,057,493,527 shares outstanding. MetLife, Inc. Form 10-Q for the quarterly period ended June 30, 2011 at cover. $115,000,000 / 1,057,493,527 = $0.11. $135,000,000 / 1,057,493,527 = $0.13. The actual charge was $0.11 per share. *Business Wire*, "MetLife Announces Third Quarter 2011 Results," October 27, 2011, 4:05 PM. Accordingly, $0.69 is more than six times larger than the low end of the disclosed range as well as the actual charge of $0.11.

43. Feinstein Amended Damages Report ¶ 227.

44. *Id.* ¶¶ 228-229.

demonstrate the opposite. For example, when discussing the charge, analysts at Bank of America Merrill Lynch considered it "non-recurring in nature," stated that it "do[es] not impact the normalized earnings power of MetLife," and did not discuss any additional costs.[45] Indeed, according to CapitalIQ, the median consensus target price for MetLife stock did not change after the October 6, 2011 disclosure.[46]

28. Professor Feinstein's estimate of alleged artificial inflation based on the information disclosed on October 6, 2011 is further unsupported given his opinion that the market for MetLife's stock was efficient during the Amended Putative Class Period and the substantial amount of information regarding the SSA-DMF issue that was available to market participants prior to October 7, 2011.[47] Indeed, he acknowledges that market participants anticipate charges of disclosed issues and that the value of a potential charge can be imputed into a stock price before the amount of the charge is disclosed, yet he ignores that this same economic principle regarding an efficient market applies to the SSA-DMF charge as well.[48]

29. Finally, Professor Feinstein claims that his event study analysis "considered and accounted for potentially confounding information" that could have affected MetLife's stock price on October 7, 2011, but he ignores that his own report cites an

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45. *See*, e.g., Bank of America Merrill Lynch, "Lowering 2011 estimate for unusual items," October 7, 2011.

46. I note that Citigroup did reduce its price target but this was for unrelated reasons. *See infra* ¶ 29.

47. In fact, Professor Feinstein documents that a substantial amount of information regarding the SSA-DMF issue was known to the market prior to October 7, 2011, including the April 25, 2011 subpoena announcement by the California Insurance Commissioner, the May 2011 Public Hearings, the July 5, 2011 subpoena announcement by the New York Attorney General, and the August 5, 2011 Disclosure. Feinstein Amended Damages Report § IV.D.

48. Feinstein Amended Damages Report ¶¶ 217-223. The same economic principle also applies to purported additional future costs, assuming any were anticipated by the market (for which Professor Feinstein provides no evidence). *See supra* ¶ 26.

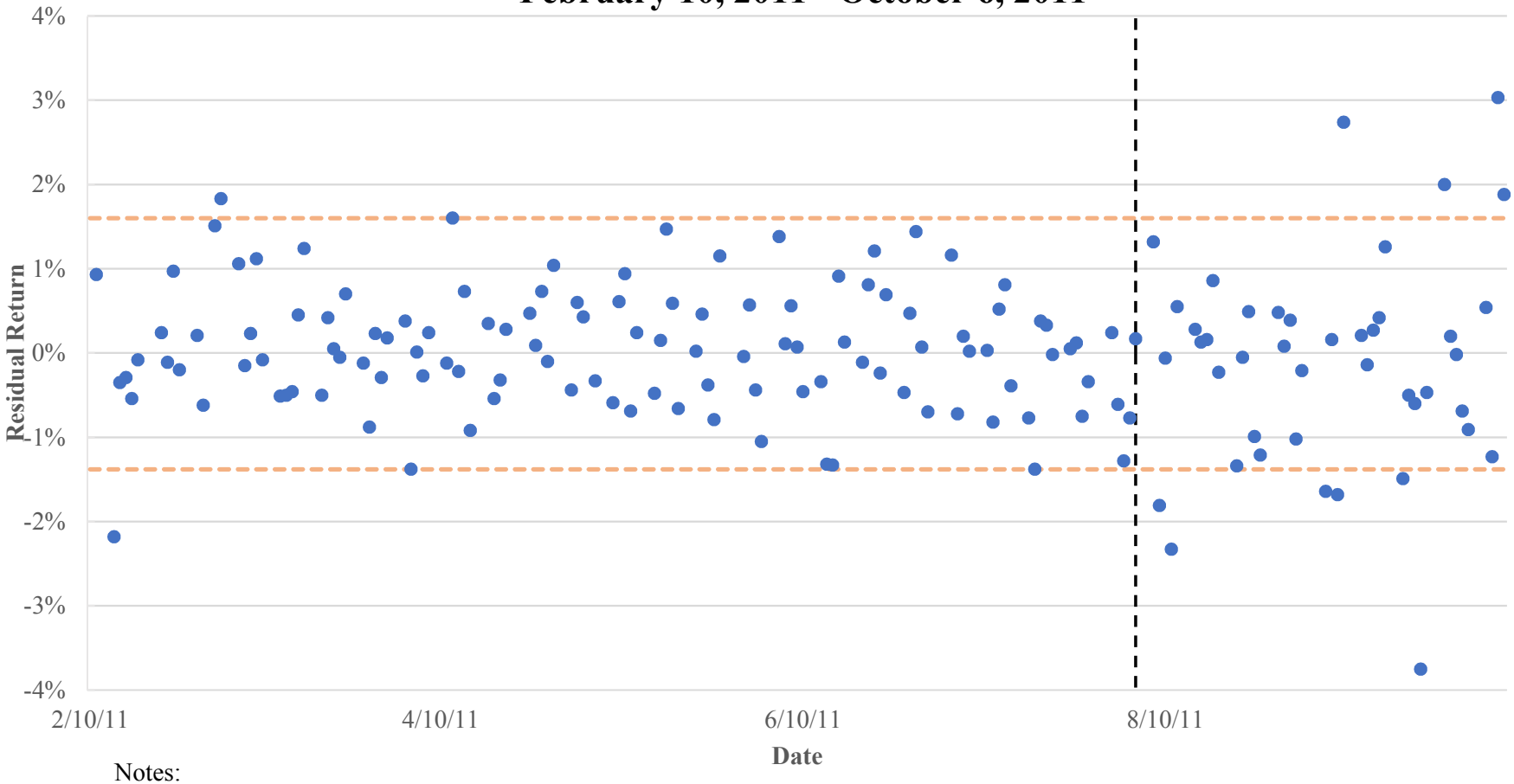
article regarding the pre-market open price change which states that "Citigroup cut its target price on the stock to $42 from $46."[49] Citigroup's target price reduction had nothing to do with the SSA-DMF charge; in fact, the report does not even mention the charge.[50] Instead, the Citigroup analysts state: "We … lowered our target price to $42 and lowered our 2011E-2013E to $5.00, $5.30, and $5.95, to reflect continued weak equity markets, low long term interest rates, and overall drop in valuations for the peer group."[51] Professor Feinstein offers no explanation for why he did not "consider[] and account[] for" this potentially confounding information.

Allen Ferrell

December 18, 2018

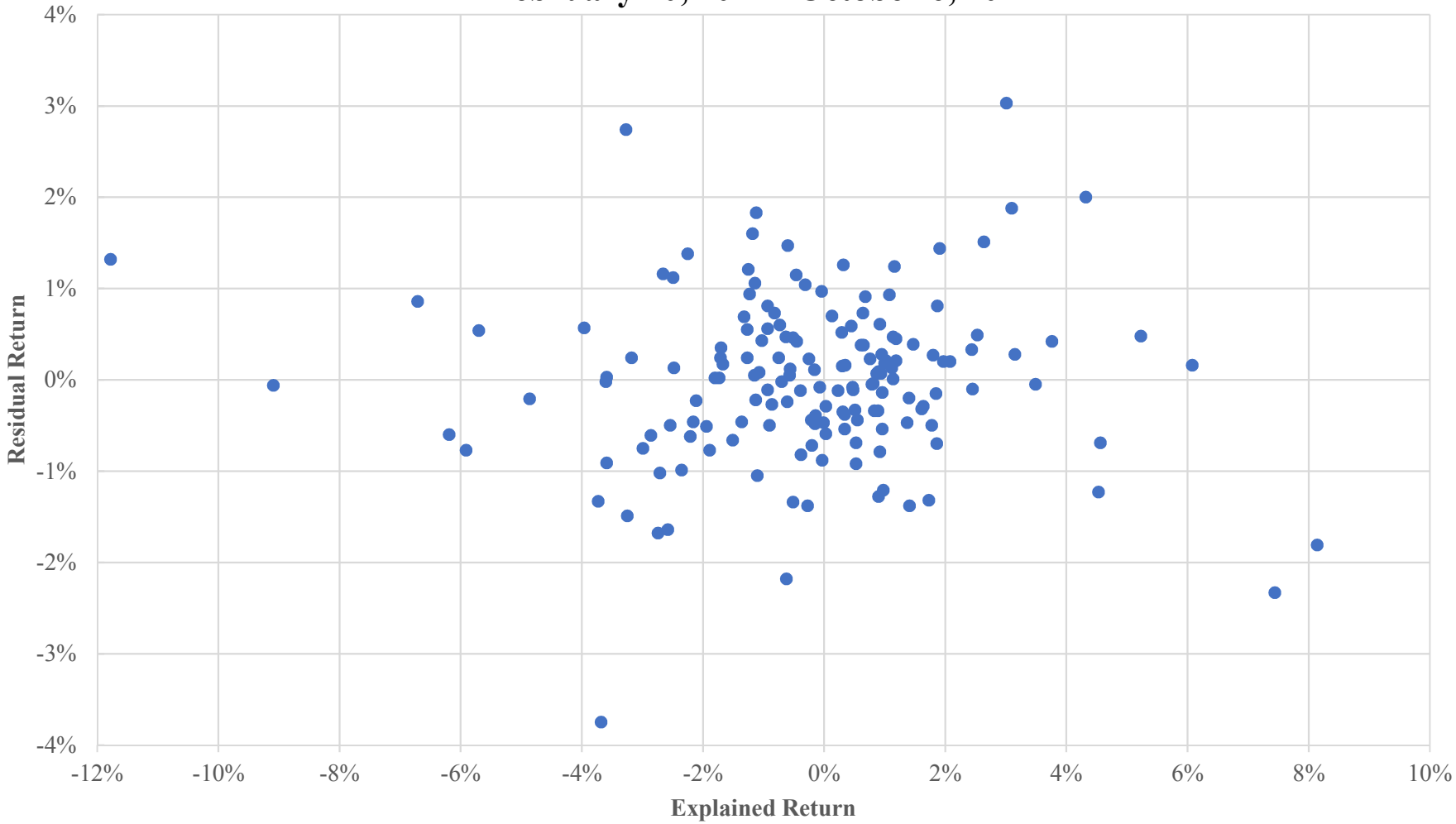
49. Feinstein Amended Damages Report ¶¶ 26 & 203.
50. Citigroup Global Markets, "Model Update," October 6, 2011. This report lists the closing price on October 6, 2011, demonstrating that it was issued after the market closed on this date and thus could have affected MetLife's stock price on October 7, 2011.
51. *Id.*

# Exhibit 1
## MetLife Inc.'s Residual Returns from Professor Feinstein's Model
## February 10, 2011 - October 6, 2011



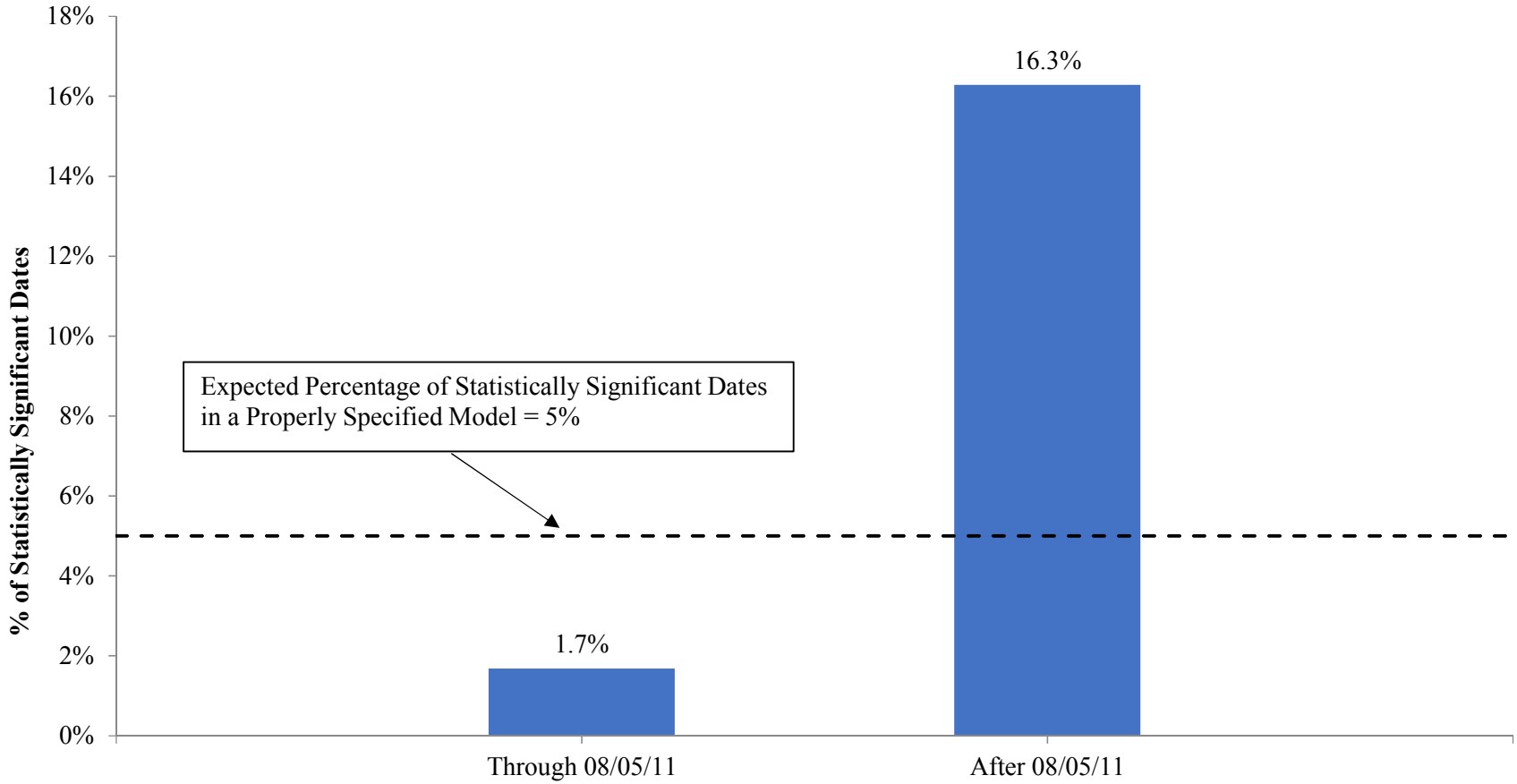

Notes:
1. Horizontal lines represent the 1st and 99th percentiles of the residual returns prior to the S&P downgrade. Prior to the S&P downgrade, 2% of the residual returns lay outside these lines; afterward, 23% of the residual returns lay outside these lines.
2. Vertical line represents August 5, 2011, the date on which S&P downgraded the U.S. credit rating.
3. Residual returns on dates that Professor Feinstein removed from his model using dummy variables are excluded.
Source: "Report On Market Efficiency, Loss Causation, And Out Of Pocket Damages" by Professor Steven P. Feinstein, Ph.D., CFA, dated December 13, 2018, Exhibit 8.

# Exhibit 2
## MetLife Inc.'s Residual vs. Explained Returns from Professor Feinstein's Model
## February 10, 2011 - October 6, 2011




Note: All returns on dates that Professor Feinstein removed from his model using dummy variables are excluded.
Source: "Report On Market Efficiency, Loss Causation, And Out Of Pocket Damages" by Professor Steven P. Feinstein, Ph.D., CFA, dated December 13, 2018, Exhibit 8.

# Exhibit 3
## Percentage of Statistically Significant Dates from Professor Feinstein's Model
## February 10, 2011 - October 6, 2011




Note: In the 119-day window through August 5, 2011, which excludes the dates Professor Feinstein removed from his model using dummy variables, there were 2 statistically significant dates. In the 43-day window after August 5, 2011, there were 7 statistically significant dates.
Source: "Report On Market Efficiency, Loss Causation, And Out Of Pocket Damages" by Professor Steven P. Feinstein, Ph.D., CFA. dated December 13, 2018, Exhibit 8.

# Exhibit 4
## MetLife Common Stock Regression Results
Estimation Period: February 10, 2011 through October 7, 2011

| Regression Statistics | |
|---|---|
| R Squared | 0.875 |
| Adjusted R Squared | 0.869 |
| Standard Error | 0.80% |
| Observations | 167 |

| | Coefficients | Standard Error | *t*-statistic |
|---|---|---|---|
| Intercept | 0.00002 | 0.0006 | 0.03 |
| Market Index | 0.120 | 0.142 | 0.84 |
| S&P Financial Index | 1.093 | 0.106 | 10.27 |
| S&P Life and Health Index (Orthogonalized) | 0.621 | 0.088 | 7.04 |
| February 10, 2011 | -1.10% | 0.73% | -1.51 |
| March 2, 2011 | -4.16% | 0.75% | -5.53 |
| May 5, 2011 | -2.26% | 0.73% | -3.10 |
| July 29, 2011 | 3.59% | 0.73% | 4.92 |
| October 7, 2011 | -2.19% | 1.31% | -1.67 |
| October 7, 2011, Residual Return* | -2.18% | 1.29% | -1.69 |

* The residual return on October 7, 2011 is calculated by transforming the regression coefficient following Peter E. Kennedy (1981). The standard error of the residual return is calculated using the Delta method.

Source: "Met_Regressn_Input.xlsx" from Professor Steven P. Feinstein, Ph.D., CFA.

# Appendix A

December, 2018

**Allen Ferrell**
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## CURRENT POSITIONS

*Greenfield Professor of Securities Law*, Harvard Law School

*National Bureau of Economic Research,* Research Associate

*Member of Editorial Board,* Journal of Financial Perspectives

*Fellow*, Columbia University's Program on the Law and Economics of Capital Markets

*Faculty Associate*, Kennedy School of Government

*Research Associate*, European Corporate Governance Institute

## EDUCATION

*Massachusetts Institute of Technology*, Ph.D. in Economics, 2005
Fields in econometrics and finance

*Harvard Law School,* J.D., 1995, *Magna Cum Laude*

- Recipient of the *Sears Prize* (award given to the two students with the highest grades)
- Editor, *Harvard Law Review*

*Brown University,* B.A. and M.A., 1992, *Magna Cum Laude*

## PREVIOUS POSITIONS

*Harvard University Fellow*
Harvard Law School, 1997

*Law Clerk*, Justice Anthony M. Kennedy
Supreme Court of the United States; 1996 Term

*Law Clerk*, Honorable Laurence H. Silberman
United States Court of Appeals for the District of Columbia; 1995 Term

**COURSES TAUGHT**

*Contracts*
*Corporate Finance*
*Law and Finance*
*Securities Litigation*
*Securities Regulation*

**REFEREE FOR FOLLOWING JOURNALS**

*American Law and Economics Review*
*Journal of Corporation Finance*
*Journal of Finance*
*Journal of Financial Perspectives*
*Journal of Law and Economics*
*Journal of Law, Economics and Organization*
*Journal of Legal Studies*
*Quarterly Journal of Economics*

**CONSULTING AREAS**

Price Impact and Securities Damages, Valuation, Mergers & Acquisitions

**Papers**

"How Accurate are Matrix Bond Prices?" with Drew Roper & Yibai Shu, Working Paper (2018)

"New Special Study of the Securities Markets: Intermediaries" with John Morley, paper for launch of Columbia University's New Special Study of the Securities Markets

"Socially Responsible Firms," with Hao Liang and Luc Renneboog, 122 *Journal of Financial Economics* 586-606 (2016) (winner of Moskowitz Prize for outstanding quantitative research)

"Price Impact, Materiality, and *Halliburton II*" with Drew Roper, 93 *Washington University Law Review* 553 (2016)

"Introducing the CFGM Corporate Governance Database: Variable Construction and Comparison to the RiskMetrics and IRRC Governance Databases" with Martijn Cremers, Paul Gompers and Andrew Metrick, Working Paper

"The Benefits and Costs of Indices in Empirical Corporate Governance Research," *in* OXFORD HANDBOOK ON CORPORATE LAW AND GOVERNANCE (2016)

"Thirty Years of Shareholder Rights and Stock Returns," with Martijn Cremers, *revise and resubmit Journal of Financial Economics*

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"Rethinking *Basic*," with Lucian Bebchuk, 69 *Business Lawyer* 671 (2014)

"Calculating Damages in ERISA Litigation," with Atanu Saha, 1 *Journal of Financial Perspectives* 93 (2013)

"Forward-casting 10b-5 Damages: A Comparison to other Methods", with Atanu Saha, 37 *Journal of Corporation Law* 365 (2011)

"Event Study Analysis: Correctly Measuring the Dollar Impact of an Event" with Atanu Saha, Working Paper (2011)

"Legal and Economic Issues in Litigation arising from the 2007-2008 Credit Crisis," with Jennifer Bethel and Gang Hu, *in* PRUDENT LENDING RESTORED: SECURITIZATION AFTER THE MORTGAGE MELTDOWN (2009)

"Securities Litigation and the Housing Market Downturn," with Atanu Saha, 35 *Journal of Corporation Law* 97 (2009)

"The Supreme Court's 2005-2008 Securities Law Trio: *Dura Pharmaceuticals, Tellabs*, and *Stoneridge*," 9 *Engage* 32 (2009)

"What Matters in Corporate Governance?" with Lucian Bebchuk & Alma Cohen, 22 *Review of Financial Studies* 783 (2009)

"Do Exchanges, CCPs, and CSDs have Market Power?," *in* GOVERNANCE OF FINANCIAL MARKET INFRASTRUCTURE INSTITUTIONS (Ruben Lee) (2009)

"An Asymmetric Payoff-Based Explanation of IPO 'Underpricing'," Working Paper, with Atanu Saha (2008)

"The Law and Finance of Broker-Dealer Mark-Ups," commissioned study for NASD using proprietary database (2008)

"Majority Voting" *in* REPORT OF THE COMMITTEE ON CAPITAL MARKETS REGULATION (2008)

"The Loss Causation Requirement for Rule 10B-5 Causes of Action: The Implications of *Dura Pharmaceuticals v. Broudo*," with Atanu Saha, 63 BUSINESS LAWYER 163 (2007)

"Mandated Disclosure and Stock Returns: Evidence from the Over-the-Counter Market," 36 *Journal of Legal Studies* 1 (June, 2007)

"Policy Issues Raised by Structured Products," with Jennifer Bethel, *in* BROOKINGS –NOMURA PAPERS IN FINANCIAL SERVICES (2007)

"The Case for Mandatory Disclosure in Securities Regulation around the World," 2 *Brooklyn Journal of Business Law* 81 (2007)

"U.S. Securities Regulation in a World of Global Exchanges," with Reena Aggarwal and Jonathan Katz, *in* EXCHANGES: CHALLENGES AND IMPLICATIONS (2007)

"Shareholder Rights" *in* REPORT OF THE COMMITTEE ON CAPITAL MARKETS REGULATION (2007)

"Creditor Rights: A U.S. Perspective," 22 *Angler- und Glaubigerschutz bei Handelsgesellschaften* 49 (2006)

"Measuring the Effects of Mandated Disclosure," 1 *Berkeley Business Law Journal* 369 (2004)

"If We Understand the Mechanisms, Why Don't We Understand the Output?", 37 *Journal of Corporation Law* 503 (2003)

"Why European Takeover Law Matters," *in* REFORMING COMPANY AND TAKEOVER LAW IN EUROPE (2003)

"Does the Evidence Favor State Competition in Corporate Law?", with Alma Cohen & Lucian Bebchuk, 90 *California L. Rev.* 1775 (2002)

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"On Takeover Law and Regulatory Competition," with Lucian Bebchuk, 57 *Business Lawyer* 1047 (2002)

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"A New Approach to Regulatory Competition in Takeover Law," with Lucian Bebchuk, 87 *Virginia Law Review* 111 (2001)

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"Federalism and Takeover Law: The Race to Protect Managers from Takeovers," with Lucian Bebchuk, 99 *Columbia L. Rev.* 1168 (1999)

**TESTIMONY LAST FOUR YEARS**

*CC IMA v. IMA Pizza*, JAMS Ref No. 1425026556, Testimony on September 13, 2018

*Bradley Cooper v. Thoratec Corporation et al.,* Case No. 4:14-cv-00360-CW, Expert report and deposition on April 11, 2018

*Blattman v. C3, Inc. et al.,* Case No. 1:15-cv-00530-GMS, Expert report and deposition on December 22, 2017

*United States v. Kaleil Tuzman*, 15 Criminal Case No. 536 (US Attorney for the Southern District of New York), testimony on December 15 and 18, 2017

*United States v. Brian Block*, 16 Criminal Case No. 595 (US Attorney for the Southern District of New York), testimony on June 13, 2017

*In re Alere-Abbott Merger Litigation*, Case No. 12963-VCG, Expert report and deposition on April 7, 2017

*Beaver County Employees' Retirement Fund, et al.,* Case No. 0:14-cv-007856-ADM-TNL, Expert report and deposition on September 16, 2016

*In re Aeropostale, Inc., et al,* Case No. 16-11275, Expert report and trial testimony in U.S. Bankruptcy Court, Southern District of New York, August 17, 2016 and deposition on August 14, 2016

*Jaffe v. Household International, Inc.*, Civil Action 02-C-5893, Expert report and depositions on May 27, 2016 and February 27, 2016

*Better & YRC Investors v. YRC Worldwide*, Civil Action No. 11-CV-2072, Expert report and deposition on March 8, 2016

*David Kaplan et al v. S.A.C. Capital Advisors, L.P.*, Civil Action No. 12-CV-9350, Expert report and deposition on March 3, 2016

*In re Genworth Financial Inc. Securities Litigation*, Civil Action No. 3:14-CV-682, Expert report and deposition on February 2, 2016

*Fosbre v. Las Vegas Sands Corp.*, Case No. 2:10-cv-00765-APG-GWF, Expert report and deposition on December 11, 2015 and March 25, 2015

*Ambac Assurance v. JPMorgan Investment Management Inc. & Assured Guaranty v. JP Morgan Investment Management, Inc.*, Civil Index No. 603755/2008, Expert report and deposition on December 2, 2015

*In re Barrick Gold Securities*, Case No. 1:13-CV-03851, Expert report and deposition on November 23, 2015

*In re Puda Coal Securities Inc. Litigation et al.*, Case No. 1:11-CV-2598, Expert report and deposition on July 29, 2015

*City of Lakeland Employees Pension Plan v. Baxter International, Inc., et al.*, Case No. 1:10-cv-06016, Expert report and deposition on June 3, 2015 and October 17, 2014

*Bruce Sherman v. Bear Stearns Companies Inc., et al,* Case No. 08 MDL No. 1963, Expert report and deposition on May 28, 2015

*Louisiana Municipal Police Employees Retirement System v. Simon Property Group, Inc.*, Case No. 7764-CS, Expert report and deposition on July 7, 2014

*In re Lehman Brothers Securities and ERISA Litigation*, Case No. 09 MD 2017, Expert report and deposition on April 24, 2014

# Appendix B

# Materials Relied Upon

## Court Document

[Proposed] Fourth Amended Class Action Complaint for Violations of the Federal Securities Laws

## Expert Reports

Expert Report of Professor Allen Ferrell, October 19, 2017

Rebuttal Report of Professor Allen Ferrell, November 30, 2017

Rebuttal Expert Report of Professor Steven P. Feinstein, Ph.D., CFA, and supporting materials, November 30, 2017

Expert Report of Professor Steven P. Feinstein, Ph.D., CFA, and supporting materials, October 12, 2018

Second Rebuttal Report of Professor Allen Ferrell, November 16, 2018

Expert Report of Professor Steven P. Feinstein, Ph.D., CFA, December 13, 2018

## Academic Articles and Books

Gujarati, Damodar N., and Dawn C. Porter, *Basic Econometrics,* Boston: McGraw-Hill Irwin 2009

Kennedy, Peter, "Estimation with Correctly Interpreted Dummy Variables in Semilogarithmic Equations," *American Economic Review* 71, no. 4 (1981)

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Salinger, Michael, "Standard Errors in Event Studies," *Journal of Financial and Quantitative Analysis* 27, no. 1 (1992)

**SEC Documents**

MetLife Inc Form 10-Q for the quarterly period ended June 30, 2011, filed August 5, 2011

MetLife Inc Form 8-K filed October 6, 2011

**Analyst Reports**

Citigroup Global Markets, "Model Update," October 6, 2011

Bank of America Merrill Lynch, "Lowering 2011 estimate for unusual items," October 7, 2011

**Press Releases and News Articles**

*Business Wire*, "MetLife Announces Third Quarter 2011 Results," October 27, 2011

**Data**

Capital IQ

CRSP US Stock and Index Databases©2018 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business.